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ABSTRACT

This paper describes the outcomes of a study that tested a path model designed to predict the quality of instructional interactions between teachers and students in 46 heterogeneous general elementary education classrooms in 14 schools. The quality of instruction interactions was measured for three groups of students, students with disabilities, students at-risk, and typically achieving students. Teachers who scored low on instructional interactions had no individual interactions with students beyond checking that they were on task. High scoring teachers engaged in significant amounts of individual discussions with students about the content and concepts of the lesson, often in prolonged interchanges. Predictors of the quality of instructional interactions were the reported level of collaboration occurring in the school and a composite measure of teacher attitudes and beliefs about the integration of students with special needs in general education classrooms. Predictors of the composite measure of teacher attitudes and beliefs toward integration were teacher efficacy and the teachers' perceptions of the amount of collaborative support received from resource teachers and teaching assistants in their classrooms. The report includes diagrams illustrating the model for predicting quality of instruction interactions in general education classrooms that include students with special needs. (Contains 17 references.) (Author/CR)

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# Toward a Framework for Predicting Effective Inclusion in General Education Elementary Classrooms

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## Abstract

In this study we tested a path model designed to predict the quality of instructional interactions between teachers and students in heterogeneous general education classrooms. The path model tested in the present study is a revision of a model previously developed and tested by Stanovich and Jordan. Modifications were made to the Stanovich and Jordan model, and a new set of data collected in 46 elementary classrooms in 14 schools. The quality of instructional interactions was measured for three groups of students, exceptional, at-risk and typically-achieving. Predictors of the quality of instructional interactions were the reported level of collaboration occurring in the school and a composite measure of teacher attitudes and beliefs about the integration of students with special needs in general education classrooms. Predictors of the composite measure of teacher attitudes and beliefs toward integration were teacher efficacy and the teachers' perceptions of the amount of collaborative support received from resource teachers and teaching assistants in their classrooms.

## Introduction

The integration of exceptional students into general education classrooms is one of several causes of the increasing diversity of those classrooms. Though much has been written about inclusion by researchers, professional educators, parents, and advocates, Pugach (1995) notes that research on instruction in inclusive classrooms is extremely sparse. Additionally, much of the research on inclusion that has been published thus far is lacking in any sort of theoretical framework. The purpose of this study (and much of our previous work) is to begin to build a theoretical framework for understanding what teacher, classroom, and school characteristics are important for developing effective inclusive classroom settings so that we can be sure that our commitment to the practice of inclusion is based solidly in the type of evidence that is required for such a major change in educational policy.

We report here the results of a path model designed to predict the quality of instructional interactions between teachers and students in heterogeneous general education classrooms. The path model presented here is a revision of a model previously developed and tested by Stanovich and Jordan (in press; 1994; Stanovich, 1994). The Stanovich and Jordan model was an application to the school setting of Ajzen's (1985, 1988, 1991) theory of planned behavior. The theory of planned behavior posits that the performance of a behavior (or set of behaviors) can be predicted by three things: attitude toward the behavior, subjective norm surrounding the behavior, and perceived behavioral control over the behavior. In the Stanovich

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and Jordan model, effective teaching in inclusive classrooms (the target behavior) was predicted by two variables: a composite measure reflecting both principals' beliefs and schools' norms regarding inclusive education (school/subjective norm) and a measure of general education teachers' behaviorally-grounded beliefs about their roles and responsibilities in meeting the needs of students with special needs (attitude toward the behavior). In the Stanovich and Jordan model, teaching efficacy (perceived behavioral control) did not have a direct effect on the target behaviors.

## The Current Revised Model

The a priori model which commenced the current study is displayed in Figure 1. This revised model represents an attempt to amplify three key constructs contained in the original Stanovich and Jordan model: school norm, perceived behavioral control, and effective teaching. First, the measurement of school norm (labeled A, in Figure 1) was expanded beyond data supplied by the principal to include data from other members of the school staff (other general education classroom teachers, the special education resource teacher, and educational assistants in the target school). School norm was also enriched by the addition of a measure of collaboration among teaching staff in the target school. Second, perceived behavioral control (labeled B in Figure 1) was strengthened by the addition of a measure of the target teacher's perception of support being received from the special education resource teacher. Third, our method of observing the outcome variable (effective teaching, labeled D, in Figure 1) was changed completely from that employed by Stanovich and Jordan. In contrast to the earlier measure, which was a more global measure of teaching effectiveness, the new classroom observation system focuses on the individual instructional interactions of teachers with three types of children: exceptional, at-risk, and typically-achieving. This examination of individual students' interactions with the teacher allows us to examine whether or not all students receive the same instructional opportunities and whether or not these opportunities can be predicted by prior variables. The measurement of the fourth variable, teacher attitudes and beliefs about integration (labeled C in Figure 1), was unchanged in the revised model.

As can be seen in Figure 1, the current model predicts several significant paths: from school norm to teacher attitudes and beliefs about integration (path A to C) and to quality of instructional interaction (path A to D), from perceived behavioral control to teacher attitudes and beliefs about integration (path B to C) and to quality of instructional interaction (path B to D), and from teacher attitudes and beliefs about integration to quality of instructional interaction (path C to D).

## Procedure and Method

The data were collected in 14 elementary schools from one school system on the outskirts of a large metropolitan area in Canada. The demographic description of this school system is almost exclusively white, low-to-middle income families. For the vast majority of students, English was the first language. Adult participants included 46 general education classroom teachers (GETs), 18 special education resource teachers (SERTs), 25 educational assistants (EAs) and 14 principals. Of the 170 student participants, 63 had been identified as exceptional (but not gifted) through

mandated special education identification procedures, 51 had been nominated by their teachers as being at-risk for school failure, and 56 were described by their teacher as typically-achieving children. Sixty-five percent of the student sample were boys, 35 % were girls.

Two visits were made to each classroom by two or three investigators from a team of nine. Both visits took place during school hours between late March and early June. Questionnaire measures were completed by the adult participants during the first school visit and classroom observations were conducted on the second visit.

The following measures were used to operationally define each of the components of the revised model.

A. School Norm. Versions of the P-I Questionnaire (for a more complete description of this construct, see teacher attitudes and beliefs, C, below) were administered to participating SERTs and principals. SERTs also completed a version of the Collaboration Questionnaire (see perceived behavioral control, B, below). The school norm measure was, therefore, a composite score that included the principal's P-I rating for the school and the measure of collaboration in the school (the mean score of the collaboration rating of the GETs, excluding the target teacher, and the SERTs in each school).

B. Perceived Behavioral Control. Participating GETs completed a modified version of Gibson and Dembo's (1984) Teacher Efficacy Scale. The Teacher Collaboration Questionnaire, designed for this investigation, required participants to code the type and extent of collaborative behavior occurring between themselves, their SERTs and their EAs. The Collaboration Questionnaire resulted in a measure of both frequency of and satisfaction with collaboration.

C. Teacher Attitudes and Beliefs. The Pathognomonic-Interventionist (P-I) Questionnaire was adapted from the P-I Interview developed and used by Jordan and colleagues (Jordan, Kircaali-Iftar & Diamond, 1992; Jordan-Wilson & Silverman, 1991; Stanovich, 1994; Stanovich & Jordan, in press). Both instruments provide a measure of teachers' behaviorally grounded assumptions and beliefs about the teaching of exceptional and at-risk students. Briefly, Jordan and colleagues have described this set of teacher beliefs and assumptions as lying along a continuum. One end of the continuum is characterized by the idea that any learning or behavioral problems exhibited by a pupil exist within the pupil. We label this set of beliefs as "pathognomonic"--meaning attitudes derived from the assumption of the presence of a specific disease entity. The pathognomonic stance reflects a very traditional set of beliefs that regard disability as being inherent within the pupil and generally results in a set of educational practices characterized by a "search for pathology" (Sarason & Doris, 1979). Examples of pathognomonic behaviors include minimal or nonexistent interventions, little interaction with resource teachers, lack of a demonstrated link between assessment and curriculum, and minimal parental contact. Teachers holding a pathognomonic set of beliefs believe that the heterogeneity in their classrooms has been imposed upon them and think that systemic measures should be employed to reduce such diversity in their classrooms.

At the other end of the continuum is a cluster of beliefs labeled as

"interventionist." Teachers holding these assumptions believe that their pupils' learning problems result from the pupil/instructional environment interaction. These teachers try significant interventions prior to making referrals to special education, work with support personnel using a team-based approach, link assessment procedures with their curriculum and instructional methods, and have regular communication with parents. Interventionist teachers are accepting of the increasing classroom diversity resulting from changes in sociocultural conditions and educational policy, and they engage in more academic interactions with their students and are more persistent in actively assisting students to construct understanding (Jordan, Lindsay, & Stanovich, 1997).

The P-I Questionnaire, developed from the P/I Interview for the present study, yields a mean score of teachers' ratings of their beliefs about their roles and their practices in working with integrated exceptional and at-risk students. Versions of the Attitude Toward Mainstreaming Scale (Berryman, 1989; Berryman, Neal, & Robinson, 1980) and the Regular Education Initiative Teacher Survey (Semmel, Abernathy, Butera, & Lesar, 1991), modified for the Canadian sample, were also administered to all participating GETs. Both questionnaires yield a mean rating score.

D. Quality of instructional interactions. A classroom observation system was designed for the present study based on earlier work conducted by Jordan et al. (1997). In that study the quality of instructional interaction was described in terms of three levels:

1. comprehension monitoring (brief and nonspecific or check and move on),
2. cognitive extension-partial (teacher-led affirmation or correction), and
3. cognitive extension-full (teacher elaboration of student response).

For the present study, the observation coding system was modified to yield a measure of both the quantity and quality of instructional interactions received by target children representing the three student groups (exceptional, at-risk, and typically achieving). Interactions were coded for the levels described above and for the consistency of the interaction, as follows:

Level 1: The teacher inconsistently checked the student with minimal interaction and moved on.

Level 2: The teacher consistently checked the student, again with minimal elaboration.

Level 3: The teacher occasionally directed the student to correct or amend or add to the work, commenting on its form or content.

Level 4: The teacher consistently directed the student to correct or amend or add to the work, commenting on its form or content.

Level 5: The teacher and student sustained an interaction during which, at least once, they engaged in a dialogue pertaining to the content of the student's written or

spoken response.
Level 6: The type of elaboration described in Level 5 occurred consistently.

## Results and Conclusions

In order to explore the empirical implications of the hypothesized path model displayed in Figure 1, a series of regression analyses were performed. However, before conducting these analyses, the model in Figure 1 had to be revised because of a marked discrepancy between the a priori conceptualization of the variables and the pattern of covariation that was revealed. The path model was therefore modified to reflect the observed relationships and can now be seen in Figure 2. Both school norm (A in Figure 1) and perceived behavioral control (B in Figure 1) had to be split into two separate constructs (now respectively A.1 and A.2, and B.1 and B.2) because their multiple indicators did not covary strongly enough to warrant the formation of a composite score. Also, after preliminary analysis, it was determined that the principals' P-I ratings of their schools would be used to represent the collective P-I beliefs of the school (school norm 1, A.1) and that the EAs' collaboration ratings would be dropped from school norm 2 (A.2). Finally, the classroom observation measure yielded three means for each teacher, one for identified exceptional, one for at-risk, and one for typically achieving groups of children. After univariate analysis on each measure revealed no significant differences between groups of children, individual group means were averaged into one score per teacher (quality of instructional interactions, D).

The final model used in the path analysis is displayed in Figure 2. To explore the implications of this model, each endogenous variable (internal to the model; Bordens & Abbott, 1988) was regressed on all of the causally prior variables. The significance or nonsignificance of the path weights then became a test of the causal structure hypothesized in Figure 2. For example, in the first analysis, the instructional interaction measure was regressed on all of the variables prior to it in the model: teacher attitudes and beliefs, school norm 1, school norm 2, perceived behavioral control 1, and perceived behavioral control 2.

The results of the first simultaneous regression analysis are presented in Table 1. The overall regression was statistically significant ($F(5,40)=2.57$, $p<.05$) with a multiple R of .493 and $R^2$ of .243. Three beta weights were statistically significant in the final regression equation: teacher attitudes and beliefs, perceived behavioral control 2, and school norm 2. Observed beta weights for school norm 1 and perceived behavioral control 1 were not significant. However, the negative beta weight on the path from perceived behavioral control to quality of instructional interactions probably indicates that it was in a suppression relationship (see Cohen & Cohen, 1983, p. 94-95) with one of the other predictor variables. Thus, the theoretical predictions in Figure 2 predicting significant paths from both teacher attitudes and beliefs and school norm 2 to quality of instructional interactions were confirmed.

The remaining components of the path model illustrated in Figure 2 were tested in a similar manner. In the second simultaneous regression displayed in Table 2, teacher attitudes and beliefs was regressed on school norm 1, school norm 2, perceived behavioral control 1, and perceived behavioral control 2. The multiple R of

this regression was .653, the multiple $R^2$ was .426, and the overall regression was statistically significant ($F(4,41)=7.61$, $p<.01$). From table 2, it can be seen that two beta weights demonstrated significant independent contributions to the prediction of teacher attitudes and beliefs: perceived behavioral control 1 and perceived behavioral control 2. Neither school norm 1 nor school norm 2 were significant predictors of teacher attitudes and beliefs. Thus, four of the nine hypothesized paths to teacher attitudes and beliefs and quality of instructional interaction displayed in Figure 2 were supported by the statistical analyses. Figure 3 summarizes the results of these structured regression analyses by eliminating nonsignificant paths. The beta weights for all significant paths are indicated.

In summary, analysis of the path model indicated that quality of instructional interactions could be predicted by two variables: teacher attitudes and beliefs toward the integration of students with special needs and the measure of collaboration in the schools. Furthermore, those teacher attitudes and beliefs were predicted by teaching efficacy and the teachers' perceptions of the collaboration being received in their classrooms.

## Discussion

Four of the nine hypothesized predictions made by the revised path model (see Figures 2 and 3) were confirmed in the analysis. While school norm 1 (the principals' reports of their schools' P-I beliefs) was not a significant predictor of quality of instructional interaction, in contrast to Stanovich and Jordan's (1994) findings, school norm 2 (the measure of collaboration in the schools) did predict this outcome measure. The complementary finding did not hold: teachers' perceptions of the collaboration being received in their classrooms, in particular the collaborative support provided by the resource teachers, did not predict the quality of instructional interactions in their classrooms.

As in Stanovich and Jordan's model, the measure of teacher attitudes and beliefs about integrating students with special needs was a significant predictor of effective teaching behavior. The present study adds to the previous study by demonstrating the effect at a more refined level, predicting the overall level and quality of individual constructivist interactions between teachers and students from all three of the targeted groups: exceptional, at-risk, and typically achieving. Teachers who scored low on the classroom observation measure had no individual interactions with students beyond checking that they were on task. High scoring teachers engaged in significant amounts of individual discussions with students about the content and concepts of the lesson, often in prolonged interchanges. The results show that differences in beliefs about integration are related to this important characteristic of effective teaching. Further, the finding that teaching efficacy predicts teacher attitudes and beliefs about the integration of students with special needs which, in turn, predicts the quality of instructional interactions occurring in classrooms, suggests that a general teacher factor of efficacy and beliefs might explain individual differences between teachers. Additionally, teachers' perceptions of collaborative support received from resource staff also appears to enhance this teaching factor by directly impacting their attitudes and beliefs about the integration of students with special needs.

The purpose of this study was to develop and test a path model of factors which contribute to the efficacy of integration. Taken together with the path model first presented and tested by Stanovich and Jordan, the current results suggest that there is promise in developing a theoretical framework for understanding which teacher, classroom, and school characteristics are important for developing effective classroom settings for students with special needs. The present study also appears to add evidence to the belief that effective teachers demonstrate their effective teaching behaviors with all students regardless of ability or disability. A necessary next step in building the framework would be the defining of appropriate student outcome measures and linking them to our measures of effective teaching.

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**Figure 1. A model for predicting quality of instructional interactions in general education classrooms that include students with special needs.**

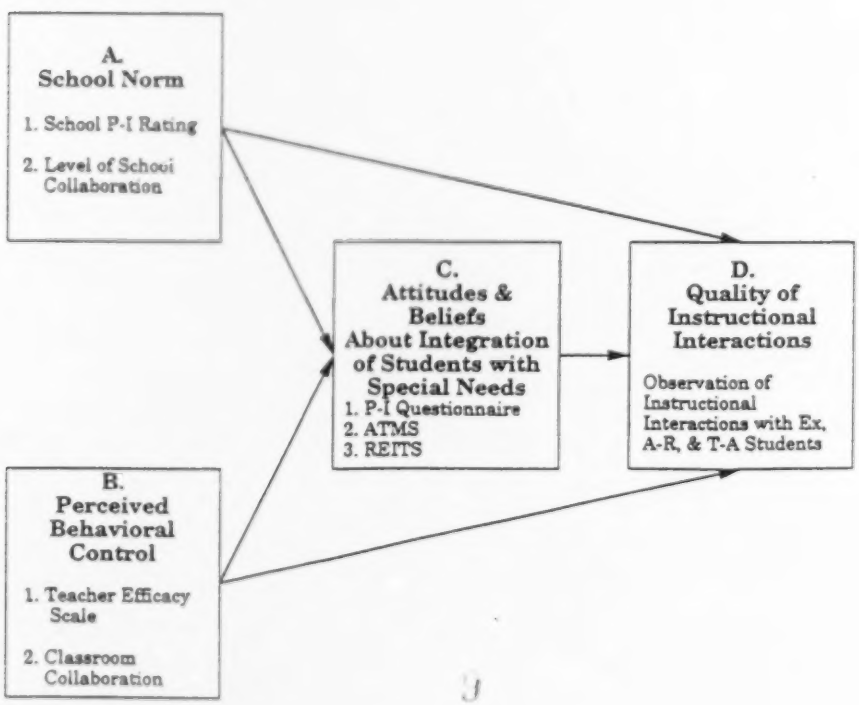

Figure 2. New hypothesized model with school norm and perceived behavioral control each split into two separate constructs.

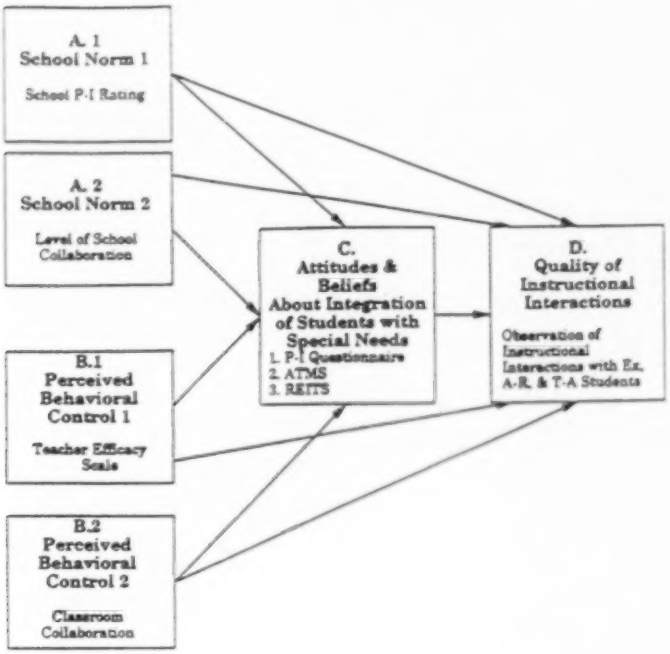


Figure 3. The model subsequent to the series of structured regression analyses with only those paths with significant beta weights indicated.

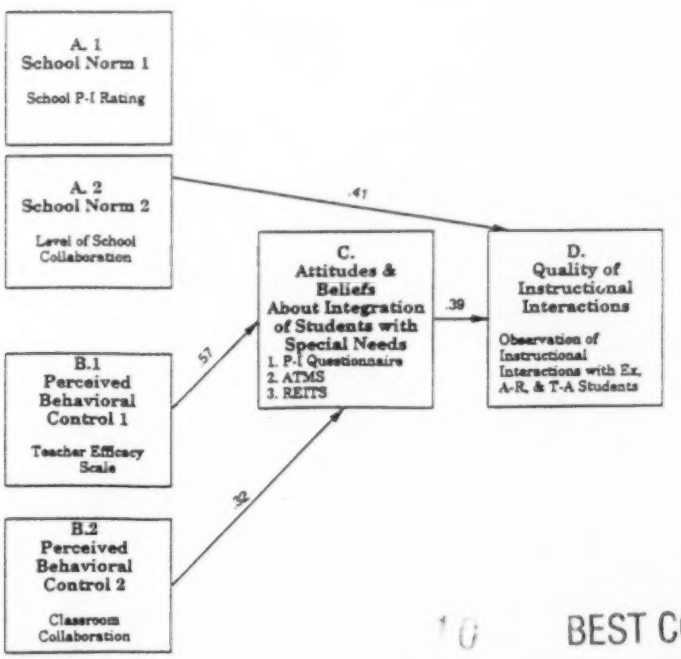


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**Table 1**

Simultaneous Regression Analysis Predicting Quality of Instructional Interactions

| Variable | Beta Weight | F ratio |
|---|---|---|
| Teacher Attitudes and Beliefs | .39 | 4.37* |
| School Norm 1 (School P-I) | .20 | 2.07 |
| School Norm 2 (School Collaboration) | .41 | 8.15** |
| Perceived Behavioral Control 1 (Teacher Efficacy) | -.15 | .68 |
| Perceived Behavioral Control 2 (Classroom Collaboration) | -.34 | 5.20* |

*p < .05, **p < .01

**Table 2**

Simultaneous Regression Analysis Predicting Teacher Attitudes and Beliefs

| Variable | Beta Weight | F ratio |
|---|---|---|
| School Norm 1 (School P-I) | .00 | .00 |
| School Norm 2 (School Collaboration) | -.11 | .89 |
| Perceived Behavioral Control 1 (Teacher Efficacy) | .57 | 22.60** |
| Perceived Behavioral Control 2 (Classroom Collaboration) | .32 | 7.95** |

*p < .05, **p < .01